

U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Zaitzevia thermae*

COMMON NAME: Warm spring zaitzevian riffle beetle

LEAD REGION: Region 6

INFORMATION CURRENT AS OF: October 4, 2005

STATUS/ACTION

☐ Species assessment - determined we do not have sufficient information on file to support a proposal to list the species and, therefore, it was not elevated to Candidate status

☐ New candidate

☒ Continuing candidate

☐ Non-petitioned

☒ Petitioned - Date petition received: **05/11/2004**

☐ 90-day positive - FR date:

☐ 12-month warranted but precluded - FR date:

☐ Did the petition request a reclassification of a listed species?

FOR PETITIONED CANDIDATE SPECIES:

- a) Is listing warranted (if yes, see summary of threats below)? **YES**
- b) To date, has publication of a proposal to list been precluded by other higher priority listing actions? **YES**
- c) If the answer to a. and b. is "yes," provide an explanation of why the action is precluded.

We find that the immediate issuance of a proposed rule and timely promulgation of a final rule for this species has been, for the preceding 12 months, and continues to be, precluded by higher priority listing actions (including candidate species with lower LPNs). During the past 12 months, almost our entire national listing budget has been consumed by work on various listing actions to comply with court orders and court-approved settlement agreements, meeting statutory deadlines for petition findings or listing determinations, emergency listing evaluations and determinations, and essential litigation-related, administrative, and program management tasks. We will continue to monitor the status of this species as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures. For information on listing actions taken over the past 12 months, see the discussion of "Progress on Revising the Lists," in the current CNOR which can be viewed on our Internet website (<http://endangered.fws.gov/>).

☐ Listing priority change

Former LP:

New LP:

Date when the species first became a Candidate (as currently defined): **11/15/1994**

___ Candidate removal: Former LPN: ___

___ A – Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

___ U – Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species.

___ F – Range is no longer a U.S. territory.

___ I – Insufficient information exists on biological vulnerability and threats to support listing.

___ M – Taxon mistakenly included in past notice of review.

___ N – Taxon does not meet the Act's definition of "species."

___ X – Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Insects, Elmidae (beetles)

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Montana

CURRENT STATES/ COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE:
Montana

LAND OWNERSHIP: Entirely within the Federal jurisdiction of U.S. Fish and Wildlife Service, Bozeman Fish Technology Center.

LEAD REGION CONTACT: Pat Mehlhop, (303) 236-4215

LEAD FIELD OFFICE CONTACT: Lori Nordstrom, (406) 449-5225, ext 208

BIOLOGICAL INFORMATION

Species Description

A small (1.8-2.2 mm long), flightless, aquatic beetle.

Taxonomy

Differences in morphologic, ecologic and genetic characters provide evidence that *Z. thermae* is a distinct species (Hooten 1991; M. Hooten, Independent Scientist, pers.comm. 2005). We recently were notified of a publication (Brown 2001) that concluded *Z. thermae* should be considered a subspecies of *Z. parvula* unless additional morphological, molecular or genetic evidence indicates otherwise. Apparently Brown (2001) was not aware of Hooten's (1991) analysis, which provided the information Brown identified would be necessary to classify *Z. thermae* as a species. Therefore, we continue to follow the classification of *Z. thermae* as a species.

Habitat/Life History

Zaitzevia thermae is globally endemic to the Bridger Creek Warm Springs near Bozeman, Montana (Hooten 1991). This spring is entirely on land managed by the Service's Fish Technology Center (FTC) and is a water source for FTC. The beetles feed on algae on the gravel bottom and among the vegetation and require flowing water to breathe. Water temperature is likely the most influential factor in the species' biology (Hooten 1991).

Historical Range/Distribution

The species is presumed to have occupied most of the available habitat in the warm spring historically. The presumed historic extent of the surface area of the warm springs was approximately 35 square meters (m²).

Current Range/Distribution

In the early 1900s a large cement collection box was built around the spring. This box now provides some protection to the riffle beetle's spring habitat and it is within this sheltered area where the majority of the *Z. thermae* population occurs. There are small seeps adjacent to the box on the both the upstream and downstream sides where *Z. thermae* occurs in small numbers (approximately 1 m² of habitat). The current extent of the surface area of the collection box is approximately 35 m².

Population Estimates/Status

No population estimates have been made. Effective methods to estimate population size have not been determined because of the difficulty caused by demographic fluctuations inherent in the population. For the present, entomologists have advised the FTC that qualitative presence/absence observations are adequate. The FTC staff now monitors the beetles monthly; every month the beetles have been documented to be present (L. Beck, Service, pers. comm. 2005). The FTC is arranging a meeting for late 2005 to work with experts to arrive at a standardized method of monitoring the population.

THREATS

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range.

The Bridger Creek warm spring is fairly protected by a cement collection box that was originally built in the early 1900s. The Bridger Creek warm spring is used as by the FTC for a water supply and this collection box has been a means to protect the water supply. Over the years there have been modifications to the collection box. For a period of time in the 1970s to early 1990s the collection box was covered with a solid metal roof, which prevented all light from entering the box. Without light, the beetle's food, algae, did not grow, thereby eliminating the interior of the box as available habitat. As a result, the beetles were only found on the outside edge of the box and a small portion of the spring nearby.

In 1993, concerns existed that the population had been severely impacted when almost all seep habitat outside the box was inadvertently buried with dirt during construction activities. The fill was immediately removed and additional habitat improvements were made. Additionally, the cover on the cement water collection box surrounding the spring was converted to a sunlight-penetrating grate, restoring former beetle habitat.

In 2002, with approval of entomologists from Montana State University, the height of the collection box roof was raised an additional 2 feet to decrease the chance of Bridger Creek runoff or flood water from entering this concrete box. The purpose of this project is to prevent potential diseases, silt, and harmful chemicals in Bridger Creek from entering FTC's warm water supply, which in turn protects the habitat of the beetle.

The potential for underground water contamination is unknown at this time. The 2003 candidate assessment form described concerns regarding the possibility of coalbed methane development in the Bridger Creek watershed that could negatively impact *Z. thermae* through the introduction of highly saline water into Bridger Creek. At this time there has been no further discussion of coalbed methane development in this watershed (L. Beck, pers. comm. 2005)

The area is now protected by a chain-link fence and signs, limiting foot traffic in the area (the area historically was used for swimming).

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes.

Not known to be a factor.

C. Disease or Predation.

Not known to be a factor.

D. The Inadequacy of Existing Regulatory Mechanisms.

The Clean Water Act provides some measure of protection with regard to water quality, but accidental contamination of the spring is a concern.

E. Other Natural or Manmade Factors Affecting Its Continued Existence.

Because of its extremely limited distribution, the species is vulnerable to randomly occurring natural and human-caused events. The purpose of the concrete box surrounding the spring is specifically for protection of the water quality of the warm spring; however, contamination or hazardous substances running into the creek (such as from vehicles using the road along the opposite shore of the creek) or the introduction of nonnative species (invertebrates, plants, other) could impact the beetle's warm spring habitat in the unlikely event the concrete box is breached.

CONSERVATION MEASURES PLANNED OR IMPLEMENTED

In 1994, the Service completed a management plan for this species (Service 1994). The FTC is in the process of updating and strengthening the management plan to ensure long-term, effective conservation of *Z. thermae*.

SUMMARY OF THREATS

Because it is a global endemic with an extremely limited range (35 m²), *Z. thermae* is at risk of randomly occurring natural and human-caused events. However, the majority of the warm spring habitat that constitutes the range of *Z. thermae* is fairly protected by a cement box, and the land is under the jurisdiction of the Service, who has been operating under a management plan

for *Z. thermae*. As a result, the magnitude of threats is low and threats are considered non-imminent. Adoption and implementation of a stronger, effective *Z. thermae* conservation strategy by the Service would address known potential threats to the maximum extent practicable.

RECOMMENDED CONSERVATION MEASURES: The Service should complete, adopt and implement the conservation strategy that is currently being developed; included in this should be a standardized monitoring protocol.

LISTING PRIORITY

THREAT			
MAGNITUDE	IMMEDIACY	TAXONOMY	PRIORITY
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11*
		Subspecies/population	12

RATIONALE FOR LISTING PRIORITY NUMBER

Magnitude: Low.

Z. thermae is a global endemic whose historic and current habitat is restricted to roughly 35 m² of warm spring habitat but that habitat is under the jurisdiction of the Service/FTC and is considerably protected by a cement box around the spring. Additionally, the FTC operates under a management plan for *Z. thermae*. Because of the protection of the habitat, the magnitude is low.

Imminence: Non-imminent.

The cement box around *Z. thermae*'s spring habitat provides a high level of protection from water contamination or trampling. Habitat conditions are being maintained within the collection box and the box has features that enable movement of individuals to and from the seeps outside the collection box. Therefore, the threats are non-imminent.

RATIONALE FOR CHANGE IN LISTING PRIORITY NUMBER

YES Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed?

Is Emergency Listing Warranted? NO. The habitat of the warm spring is fairly protected by the

collection box around the spring and FTC staff regularly monitor presence/absence of the beetles.

DESCRIPTION OF MONITORING

Effective methods to estimate population size have not been determined because of the difficulty caused by demographic fluctuations inherent in the population. For the present, entomologists from Montana State University have advised FTC that qualitative presence/absence observations are adequate. The FTC staff now monitors the beetles monthly; every month the beetles have been documented to be present (L. Beck, pers. comm. 2005). The FTC held a meeting in January 2006 to work with experts to arrive at a standardized method of monitoring the population.

COORDINATION WITH STATES

Indicate which State(s) provided information or comments on the species or latest species assessment: None--Montana Fish, Wildlife and Parks does not have staff with expertise related to this species.

Indicate which State(s) did not provide any information or comments: Montana Fish Wildlife and Parks (as stated above, they do not have staff with expertise related to this species). Montana Natural Heritage Program has an aquatic ecologist on staff but at this time they have not provided information or comments.

LITERATURE CITED

- Brown, H.P. 2001. Synopsis of the riffle beetle genus *Zaitzevia* (Coleoptera: Elmidae) in North America, with description of a new subgenus and species. *Entomological News* 112:201-211.
- Hooten, M.M. 1991. Biological systematics of *Zaitzevia thermae* (Hatch). M.S. Thesis. Montana State University, Bozeman.
- U.S. Fish and Wildlife Service. 1994. Conservation management of "Thermie" (*Zaitzevia thermae*) and Brown's riffle beetle (*microcyloepus browni*) at the Bozeman Fish Technology Center. Unpublished Report, Bozeman, Montana.

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve: Sharon Rose
Acting Regional Director, Fish and Wildlife Service

11/4/2005
Date



Concur: _____
Director, Fish and Wildlife Service

August 23, 2006
Date

Do not concur: _____
Director, Fish and Wildlife Service

Date